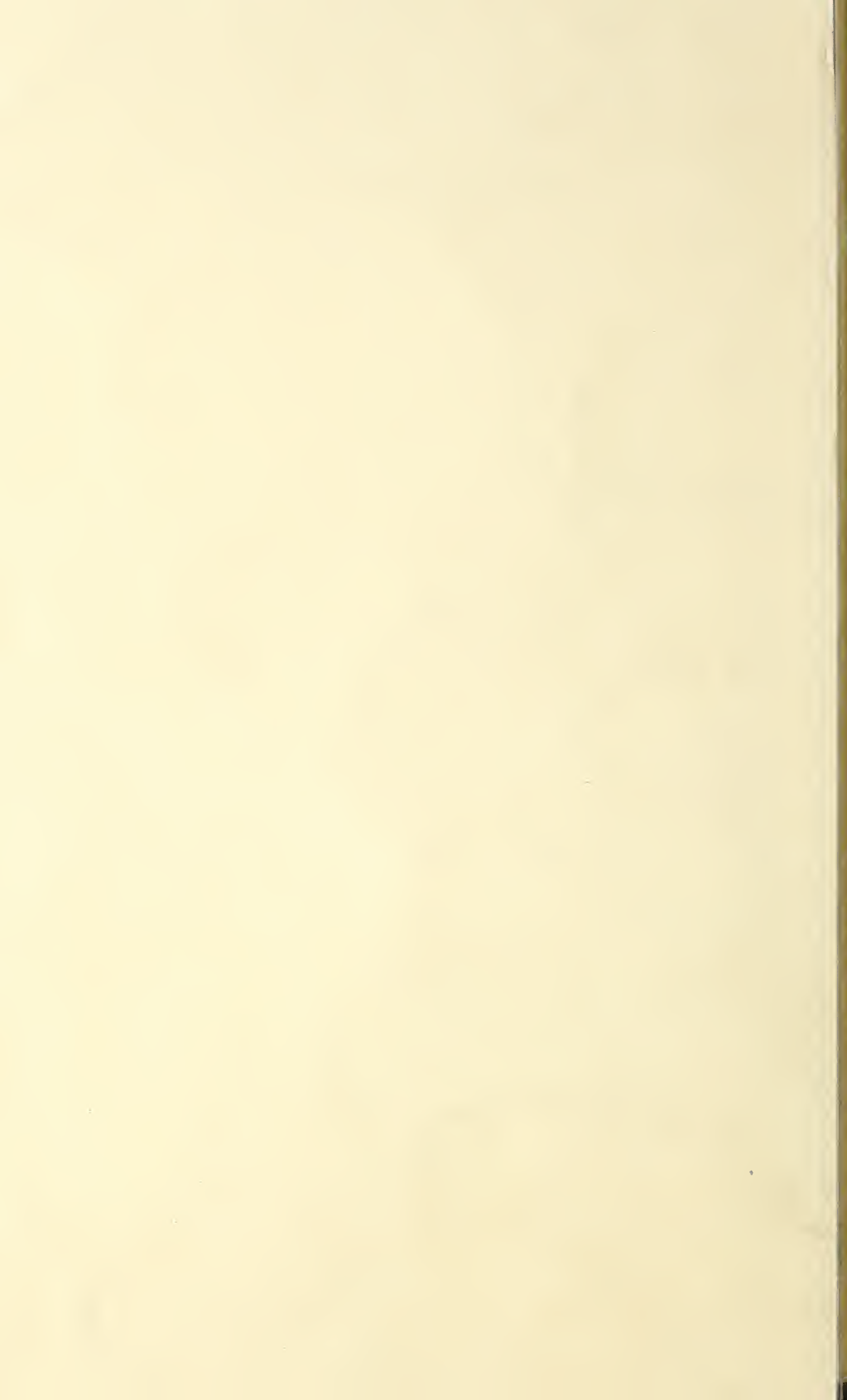


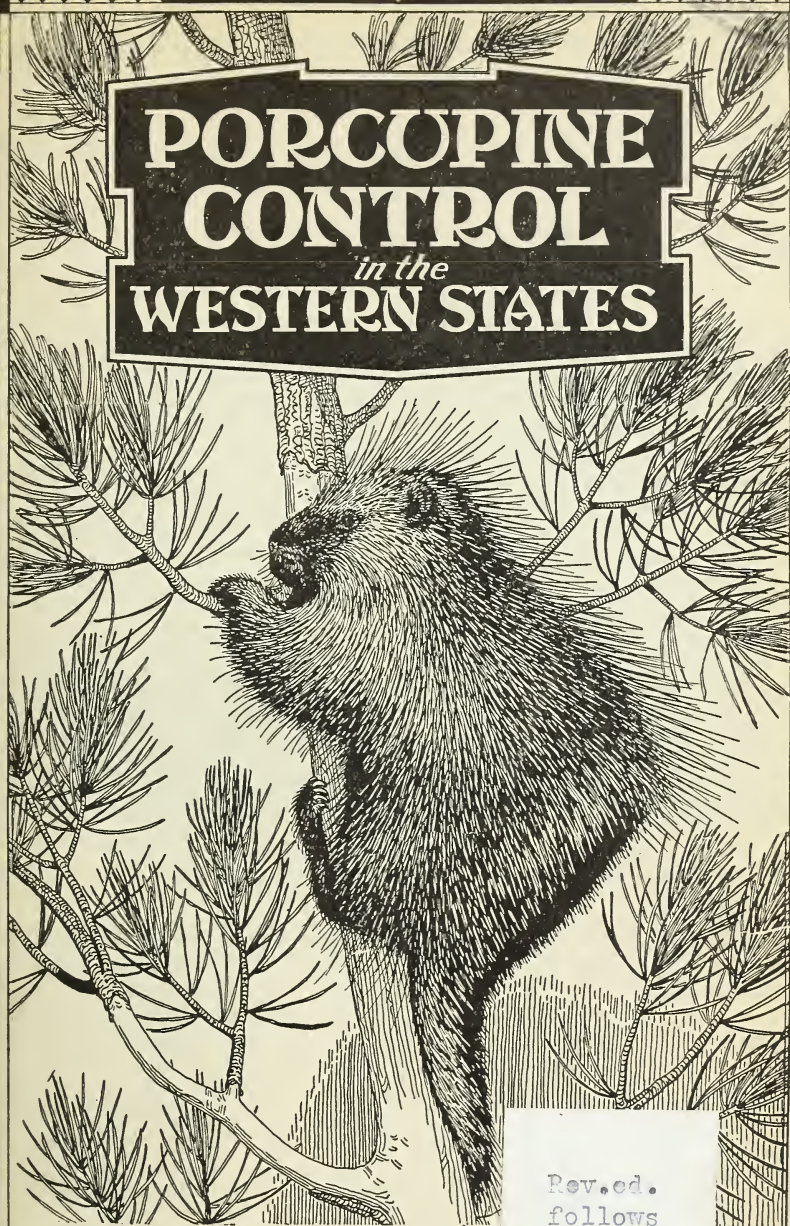
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# PORCUPINE CONTROL *in the* WESTERN STATES



Rev.ed.  
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LEAFLET



No. 60

Issued May, 1930

# PORCUPINE CONTROL IN THE WESTERN STATES

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**P**ORCUPINES differ from other rodents of their size in having a characteristic coat of bristling quills. The yellow-haired porcupine of the West (*Erethizon epiranthum*) is brownish black in general color and when full grown weighs 13 to 25 pounds, the females being considerably the smaller. In movement the animals are slow and deliberate, both in trees and on the ground, and usually appear to be confident of their ability to take care of themselves. The hairs on the back and sides that have developed into spiny quills are half an inch to 3 inches long, and the quills, which are white with dark tips and sharp and finely barbed at the tip, are used as a means of defense when in actual contact with enemies. They are not thrown. The effectiveness of these barbs is increased by the fact that when the quills become detached and are carried off by an enemy or other animal, the victim's own movements have the effect of embedding them more and more deeply in the muscles. They may then cause intense suffering and even death. Occasionally livestock and game animals are injured by getting porcupine quills in the nose, mouth, tongue, or about the head. The affected parts sometimes become so swollen that the animals are prevented from eating and so may starve to death.

One young, weighing about  $1\frac{1}{4}$  pounds, is born, usually in spring. The length of the gestation period is not definitely known. Even at birth the young porcupines show a tendency to protect themselves by turning their backs to the intruder, although at this time the quills are small.

**PORCUPINES** are not fastidious in their choice of food but consume succulent plants of many species and the buds, leaves, and inner bark and cambium of numerous kinds of trees. In general, during summer they feed upon juicy ground vegetation. Their fall and winter diet consists largely of bark and leaves of coniferous trees, especially the western yellow pine (*Pinus ponderosa*) and several species of juniper. Damage to cultivated crops caused by porcupines occurs chiefly during the spring and summer months and includes the destruction of young fruit trees, and the defoliation of more mature ones, eating and wallowing down alfalfa, and feeding upon many truck crops. By far the most serious damage from an economic standpoint, however, is their injuring or killing of young forest trees.

During the late summer, fall, and winter months, porcupines in their efforts to get at the inner layer of bark often partly or completely girdle the main leaders, or boles, of the trees. (Fig. 1.) Many of the small seedlings (up to 5 years of age) are completely consumed, while the larger ones frequently suffer injury serious



enough to cause their death, but more often this injury results in a weakened bushy topped or spike-top tree useless for commercial purposes. (Fig. 2.) In areas of heavy infestation, 10 to 100 per cent of the young growth is thus damaged. Porcupine control has been stimulated during recent years by reason of the increasing numbers of these rodents throughout their range in the Western States, and the development of efficient methods has been called for. As porcupines will eat practically all kinds of vegetation, their greater abundance results in increased and more widespread damage to crops and trees. This is particularly noticed among the forest trees, where their destructiveness in many places is second only to that of fire.



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FIGURE 1.—A, Lodgepole pine in Oregon completely girdled by porcupines; B, lodgepole pine girdled by porcupines in Routt National Forest, Colo.

THE MIGRATIONS of the porcupine are of two forms, the chief one being a seasonal and the other an interseasonal, or purely feeding, movement. Seasonal movements are definite and pronounced and are governed by climatic factors and food supply. The direction varies in different regions and depends upon the rainfall and upon the nature of the winter precipitation. In the more humid Northwest the spring movement consists of a slow and deliberate migration from the cliffs and lava rims to mountain meadows and valley farms in search of succulent food. With the approach of the first cold fall rains there occurs a more rapid movement back to the shelter of the lava dens, in which during stormy weather the porcupines remain for varying periods. The fall and winter feeding in this region is usually within a quarter of a mile of these rim rocks. The bark of western yellow pine and occasionally of other trees comprises most of the food during this season.

In some localities, particularly in the more arid southwestern region, a rapid migration takes place during fall, extending from the higher elevations down to sheltered areas of the forest, where large numbers

of porcupines congregate for the winter. Here the animals remain in the larger black-jack pines (young yellow pines), where their feeding activities result in the girdling of large portions of the upper side of most branches and the upper part of the tree bole. Deep snow holds the animals to these individual trees for periods of one to three months. With the melting of snow in spring and the growth of succulent ground vegetation, the animals resume their ground feeding, moving again to the higher elevations as the season advances. Even in localities where there are no marked changes in elevation, the movement is almost as definite toward places that offer greener food during summer. In the drier regions, when both water and the resultant abundance of vegetation are lacking, the migration extends over a greater area than in the more humid coastal region. Excessive damage to individual large trees occurs during winter, but girdling of the smaller pines is commonest late in summer, in fall, and early in winter. In general, these movements depend upon the availability of food and shelter.



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FIGURE 2.—A spike-top yellow pine caused by a porcupine remaining in the tree for an extended period during winter and feeding exclusively on the inner bark and cambium layer of the upper parts

The interseasonal, or strictly feeding, movements of the porcupines are less definite and, although they are in the general direction of the seasonal migration, they represent simple foraging activities.

THE SYSTEMATIC hunting of porcupines as a control measure on large timbered areas is of doubtful economic value, being far less effective and more expensive than control by poisoning operations. In regions where snow remains on the ground for a couple of months during winter, thus causing the animals to concentrate in areas where food and shelter are accessible, hunting is effective. Under such conditions it is sometimes possible in a limited area to destroy about 50 animals a day.

Control by  
Hunting and  
Shooting



In the Southwest the concentration areas are usually situated several miles from the summer feeding areas and are easily located during the summer months by the extent of girdling of the large trees. Large accumulations of old fecal pellets beneath these trees also serve as a guide. During the period of snow one can shoot enough porcupines at these places to make the visit worth while. Hunting in such areas at other seasons is not profitable, and during the summer months there may be a total absence of the animals there.

THE PORCUPINE'S fondness for salt—a taste that it has in common with many other animals—has been successfully used as a basis on which to develop effective poison methods. Because of the universal appeal of salt to stock and game animals, however, extreme caution is necessary in using salt-poison baits for porcupines. Where there are suitable rock formations near acceptable feeding grounds, the rock dens offer an excellent opportunity for reducing the number of porcupines without endangering livestock.

#### Control by Poisoning

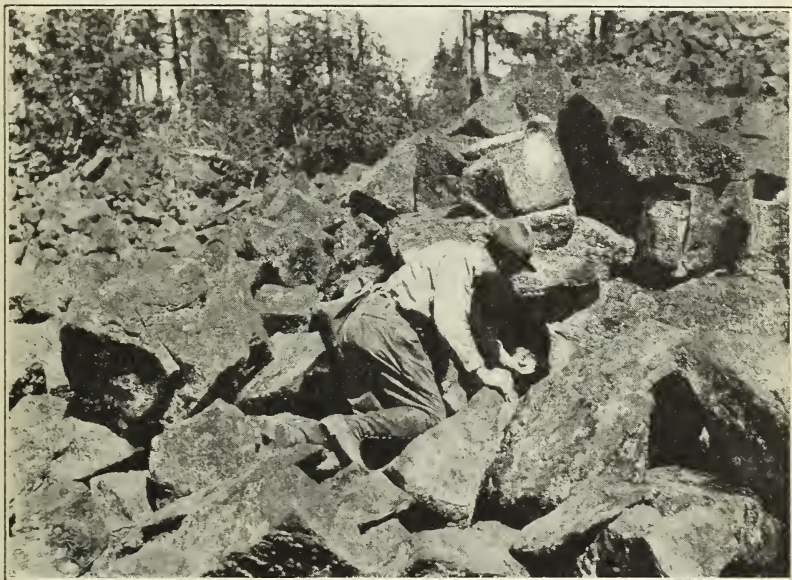


FIGURE 3.—A typical porcupine den

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The procedure is simple. The poison is prepared by thoroughly mixing 1 ounce of powdered strychnine with 1 pound of finely crystallized table salt. This is placed in the dens used by porcupines, about 1 tablespoonful to a bait, in such way that it will be absolutely inaccessible to livestock or to game animals. The bait should be put where it will be sheltered from the weather, and on a small ledge whenever possible. Poisoned porcupines can not then fall on the baits, as they frequently do when the poison is placed directly in their runways. As these rock dens may have several entrances, it is well to put a number of baits in sheltered places where they will be available to the animals traveling in any direction.

Where there are no ledges, flat rocks and the salt blocks described later may be used to expose the poison. In the humid sections of the Northwest the salt draws moisture and quickly hardens to form a lick on the rocks, which is effective for a long period against any porcupine passing that way. In more arid regions, as such caking does not occur, the salt will be brushed or blown away, and more frequent baiting

will be required.

Under such conditions it is well to mix half an ounce of magnesium carbonate with each pound of the salt-strychnine mixture. Under ordinary weather conditions this draws moisture enough to cause caking and thus prevents its being blown away or brushed away by animals traveling over it. In extremely dry, windy weather a small quantity of water may be added to cause immediate caking.

If wood rats are plentiful about these rocky ledges, it may be necessary to destroy them before the porcupines can be successfully poisoned.

Dens are rarely found on northern exposures, the great majority being situated on slopes facing south or partly south, where dryness and warmth prevail. They are of two types and are easily located by the great quantities



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FIGURE 4.—Porcupine den in a rocky fissure

of pellets and tracks present. Masses of broken rock that have formed talus slopes at the bases of cliffs and rims provide the porcupine dens with innumerable passages and runways, well suited to their use. (Fig. 3.) Other dens are situated in caves and fissures in solid rocks, frequently in most inaccessible places. (Fig. 4.) These dens are not individual homes, except those chosen by females at the time the young are born, but are used by any porcupines that may be in the neighborhood. In large dens as many as 19 carcasses



have been found in a month's time after poisoning operations, although a smaller number is more usual.

WHERE there are no rock outcroppings and lava flows suitable for dens of porcupines, and in large areas inhabited by porcupines but devoid of dens, seasonal migrations are marked and traceable, and thus offer a mode of attack. Porcupines pass frequently over favorite lines of migration,

or travel ways. Here they feed upon ground vegetation by night and seek safety during the day in the larger trees.

It is the habit of these animals as they migrate to stop during the daytime in certain "rest" trees that have been used by other porcupines passing over the same route. These "porcupine trees," as they are locally termed, are usually black-jack, or bull, pines, 4 to 20 inches in diameter breast high, and show some slight damage in the form of girdled branches, but not the excessive damage of trees used by porcupines for a winter residence. (Fig. 5.)

The constant recurrence of such individual trees along definite lines of seasonal migration affords a second method of control by poisoning. Blocks of wood cut into 5-inch lengths from common 2 by 4 inch or 2 by 3 inch wood are made into cups by boring two

$\frac{1}{4}$ -inch auger holes to a depth of  $1\frac{1}{2}$  inches into the 2-inch edge of the block. The wood between these holes is removed and a cavity  $1\frac{1}{4}$  by  $3\frac{1}{2}$  inches is thus formed. Two  $\frac{1}{4}$ -inch holes are bored through the broad side of the block for inserting nails to attach the block to the tree. (Fig. 6, A.) These blocks are nailed securely to the tree bole with the large hole uppermost and the top of the block 8 inches above one of the larger branches and far enough above the



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FIGURE 5.—A typical black-jack pine used as a "rest station" by porcupines as they travel over their line of migration. This is an excellent type of tree in which to place poison blocks

ground to be safely out of the reach of wild game and domestic livestock. (Fig. 6, B.)

Two or three heaping tablespoons of a salt-strychnine mixture are placed in the cup and thus made available for any porcupines that may occupy the tree. The salt-strychnine mixture is prepared in the proportion of 1 pound of common table salt, 1 ounce of powdered strychnine, and one-half ounce of magnesium carbonate. The magnesium carbonate keeps the poisoned salt from being blown out of the blocks and renders the poison more impervious to storms.

Lines of poison stations are established in trees at right angles to and extending across the lines of migration, and because of the lesser movement of porcupines during winter they should be placed some distance from the areas used as winter quarters by the animals and

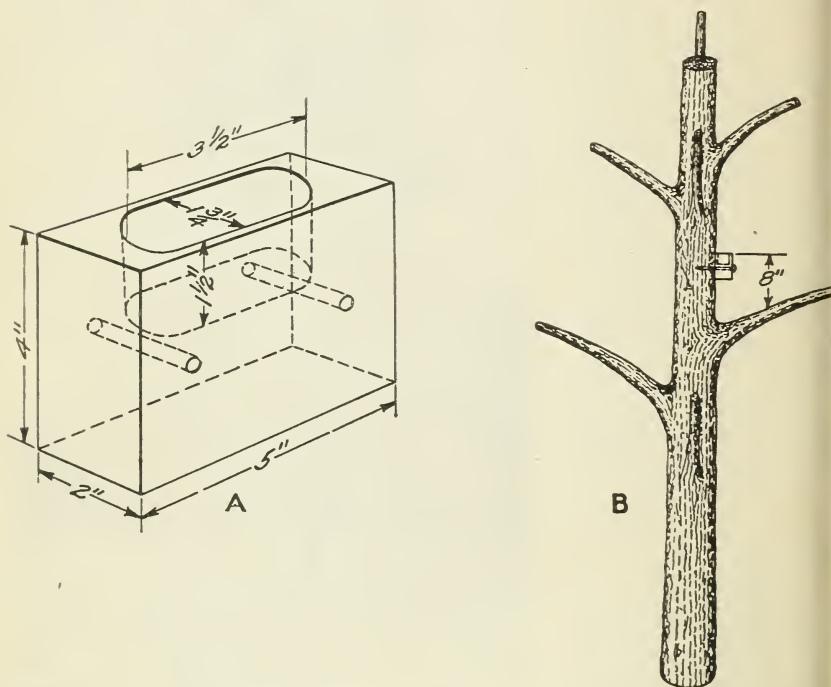


FIGURE 6.—A, Diagram for preparing a wooden cup for use in exposing poisoned salt for porcupines; B, method of attaching poison block to pine tree

toward the direction of migration. The blocks then are available during the spring and fall migrations. In areas where the porcupines have a more restricted range, the stations may be established near the meadows and summer feeding grounds.

Intelligent and persistent use of one or a combination of these methods will ultimately result in effective control of porcupines. Results can not be looked for immediately, and failure to find dead porcupines one month after placing the bait is no indication of failure. The methods of control here outlined are based upon the seasonal movements and feeding habits of the porcupines. After placing the baits one or more years may be required to obtain complete control.





